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# तकनीकी ड्राइंग — आयाम और छूटें अंकित करना — अदृढ़ पुर्जे

*Indian Standard*

# TECHNICAL DRAWINGS — DIMENSIONING AND TOLERANCING — NON-RIGID PARTS

ICS 01.100.20

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**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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## NATIONAL FOREWORD

This Indian Standard which is identical with ISO 10579 : 1993 'Technical drawings — Dimensioning and tolerancing — Non-rigid parts' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Drawings Sectional Committee and approval of the Basic and Production Engineering Division Council.

This standard gives rules for dimensioning and tolerancing non-rigid parts where restraining of features is required during verification of dimensions and tolerances specified on a drawing.

The text of ISO Standard has been approved as suitable for publication as Indian Standard without deviations. In this adopted standard, certain terminology and conventions are not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a full point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated :

| *International Standard* | *Corresponding Indian Standard* | *Degree of Equivalence* |
|---|---|---|
| ISO 1101:1983 | IS 8000 (Part 1) : 1985 Geometrical tolerancing on technical drawings: Part 1 Tolerances of form, orientation, location and run-out and appropriate geometrical definitions (*first revision*) | Identical |

This adopted standard also gives Bibliography in Annex A which is informative. The corresponding Indian Standards against the ISO standards are given below along with their degree of equivalence for the editions indicated:

| *International Standard* | *Corresponding Indian Standard* | *Degree of Equivalence* |
|---|---|---|
| ISO 2692:1988 | IS 8000 (Part 2) : 1992 Technical drawings — Geometrical tolerancing: Part 2 Maximum material principles | Identical |
| ISO 5459:1981 | IS 10721 : 1983 Datum and datum systems for geometrical tolerancing on technical drawings | do |
| ISO 5458:1987 | IS 13099 : 1991 Technical drawings — Geometrical tolerancing — Positional tolerancing | do |

## *Indian Standard*

# TECHNICAL DRAWINGS — DIMENSIONING AND TOLERANCING — NON-RIGID PARTS

## 1 Scope

This International Standard gives rules for dimensioning and tolerancing non-rigid parts where restraining of features is required during verification of dimensions and tolerances specified on a drawing.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1101:1983, *Technical drawings — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

**3.1 non-rigid part:** Part which deforms to an extent that in the free state is beyond the dimensional and/or geometrical tolerances on the drawing.

**3.2 free state:** Condition of a part subjected only to the force of gravity.

## 4 Basic principles

The distortion of a non-rigid part must not exceed that which allows the part to be brought within specified tolerances for verification and positioning at assembly, or assembled, by applying pressure or forces not exceeding those which can be expected under normal assembly conditions. It is impossible to avoid the effect of natural forces such as gravity; but the extent of distortion may depend upon the orientation of the part and condition of the part in the free state. If it is necessary to indicate the geometrical tolerance in the free state, the conditions under which the tolerance is to be achieved (i.e. the direction of gravity, conditions in which it is to be supported, etc.) may have to be indicated in a note, as shown in annex A. For non-rigid parts, identified on the drawing by the added statement "ISO 10579-NR", the restrained condition applies unless the dimensions and tolerances are qualified by the symbol Ⓕ, see clause 5.

## 5 Indications on drawings

Drawings of non-rigid parts shall include the following indications as appropriate (see also annex A):

a) in or near the title block, the indication "ISO 10579-NR";

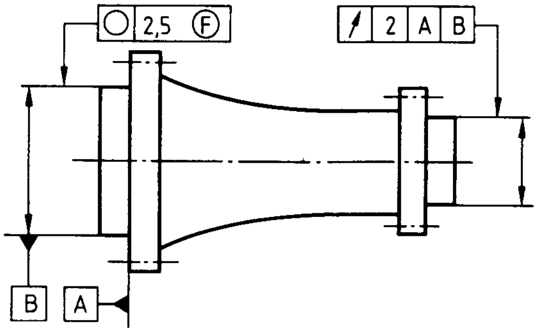
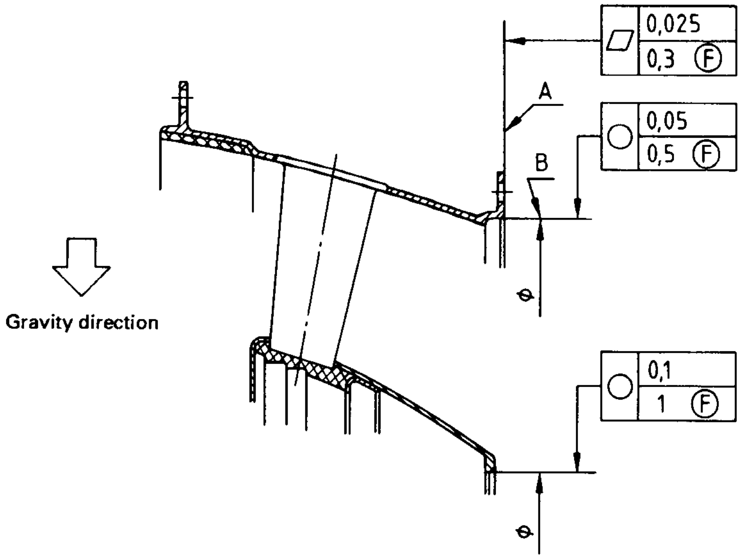
b) in a note, the conditions under which the part shall be restrained to meet the drawing requirements;

c) geometrical variations allowed in the free state, with the modifying symbol Ⓕ included in the tolerance frame in accordance with ISO 1101;

d) the conditions under which the geometrical tolerance under free state is achieved, such as direction of gravity, orientation of the part, etc.

# Annex A
## (informative)

## Examples of indication and interpretation

| **Indication on the drawing** | **Interpretation** |
|---|---|
|  <br>ISO 10579-NR<br>Restrained condition: The surface indicated as datum A is mounted (with 64 bolts M6 tightened to a torque of 9 N·m to 15 N·m) and the feature indicated as datum B is restrained at the corresponding maximum material limit. | The geometrical tolerance, followed by the symbol Ⓕ, shall be ensured in the free state. Other geometrical tolerances apply under the conditions indicated in the note. |
| **Indication on the drawing** | **Interpretation** |
|   0,025<br>0,3 Ⓕ<br>A<br>0,05<br>0,5 Ⓕ<br>B<br>Gravity direction<br>0,1<br>1 Ⓕ<br>ISO 10579-NR<br>Restrained condition: The surface indicated as datum A is mounted (with 120 bolts M20 tightened to a torque of 18 N·m to 20 N·m) and the feature indicated as datum B is restrained at the corresponding maximum material limit. | The geometrical tolerances, followed by the symbol Ⓕ, shall be ensured in the free state. Other geometrical tolerances apply under the conditions indicated in the note. |

## Annex B
(informative)

## Bibliography

[1] ISO 2692:1988, *Technical drawings — Geometrical tolerancing — Maximum material principle.*

[2] ISO 5459:1981, *Technical drawings — Geometrical tolerancing — Datums and datum-systems for geometrical tolerances.*

[3] ISO 5458:1987, *Technical drawings — Geometrical tolerancing — Positional tolerancing.*

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### Amendments Issued Since Publication

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